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EXAMINER

ROBERTSON, JEFFREY

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 01/21/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/889,587

Applicant(s)

ANDO ET AL.

Examiner

Jeffrey B. Robertson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is objected to because of the following informalities: on pages 3, 6, and 8, applicant has underlined variables a, b, and m in the definitions following the formulas. Since the variables are not underlined in the formulas, they should not be underlined in the definitions.

Appropriate correction is required.

### ***Claim Objections***

3. Claims 2-4 are objected to because of the following informalities: in claim 2, applicant has underlined the variables a, b, and m in the definitions presented after the structural formulas in the claim. Since the variables are not underlined in the formulas, they should not be underlined in the definitions. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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For claim 1, in (I), applicant sets forth that (I) is a reactive silicon-group containing polyoxyalkylene polymer. The claim then specifies an "introduction rate" of a reactive silicon group. The claim is indefinite because it is unclear if applicant is claiming additional silicon groups added to the silicon-group containing polyoxyalkylene, or if the "introduction rate" is the amount of silicon groups already attached to the polyoxyalkylene. It is also not clear if the "molecular terminus" referred to is the terminus of the unmodified polyoxyalkylene or that of the silicon group-containing polyoxyalkylene.

For claim 2, the use of the word "obtainable" is indefinite because it is not known if the silicon group-containing polyoxyalkylene polymer is obtained by the recited method or not. Also in claim 2, lines 11 and 18, applicant sets forth a Markush group for "the constituent atom" on the  $R^2$  bivalent group. However, there is necessarily more than one constituent atom present in the  $R^2$  group, and therefore constituent atom should be plural.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Isayama et al. (U.S. Patent No. 4,657,986).

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For claim 1, in Preparation Example 2, column 9, lines 17-38, Isayama teaches the preparation of a propylene oxide polymer that contains reactive silicon groups at the chain ends. Isayama teaches that by NMR, at the chain ends, the polypropylene oxide has 1.7 silicon groups in a molecule. Since the maximum amount of silicon groups at the chain end per molecule is 2.0, the amount of the silicon groups is  $1.7/2.0 = 85\%$  per molecule. For claim 2, Isayama teaches that the terminal groups of the polypropylene oxide are allyl ether groups or  $(CH_2=CHCH_2O-)$  groups. This falls within applicant's general formula (1) wherein  $R^1=H$  and  $R^2=-CH_2-$ . Isayama teaches that the silane used is methyldimethoxysilane, which falls within applicant's general formula (3) wherein  $m=0$ ,  $a=2$ ,  $X=$ methoxy, and  $R^4=$ methyl. Here, Isayama also teaches the use of a platinum or Group VIII transition metal catalyst. In column 6, lines 34-61, Isayama teaches the addition of an epoxy resin to the composition.

For claim 4, in column 7, lines 20-50, Isayama teaches the addition of a compound that has groups reactive with epoxy and silicon groups.

8. Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirose et al. (U.S. Patent No. 4,952,643).

For claim 1, in Preparation Example 1, column 10, lines 13-33, Hirose teaches the preparation of a propylene oxide polymer that contains reactive silicon groups at the chain ends. Hirose teaches that by NMR, at the chain ends, the polypropylene oxide has 1.7 silicon groups in a molecule. Since the maximum amount of silicon groups at the chain end per molecule is 2.0, the amount of the silicon groups is  $1.7/2.0 = 85\%$  per molecule. For claim 2, Hirose teaches that the terminal groups of the polypropylene

oxide are allyl ether groups or  $(\text{CH}_2=\text{CHCH}_2\text{O}-)$  groups. This falls within applicant's general formula (1) wherein  $\text{R}^1=\text{H}$  and  $\text{R}^2=-\text{CH}_2-$ . Hirose teaches that the silane used is methyldimethoxysilane, which falls within applicant's general formula (3) wherein  $m=0$ ,  $a=2$ ,  $\text{X}=\text{methoxy}$ , and  $\text{R}^4=\text{methyl}$ . Here, Hirose also teaches the use of a platinum or Group VIII transition metal catalyst. In column 7, lines 31-58, Hirose teaches the addition of an epoxy resin to the composition.

For claim 4, in column 8, line 65 through column 9, line 33, Hirose teaches the addition of a compound that has groups reactive with epoxy and silicon groups.

9. Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Homma et al. (U.S. Patent No. 4,981,728).

For claim 1, in Preparation Example 1, column 11, lines 17-46, Homma teaches the preparation of a propylene oxide polymer that contains reactive silicon groups at the chain ends. Homma teaches that by NMR, at the chain ends, the polypropylene oxide has 1.75 silicon groups in a molecule. Since the maximum amount of silicon groups at the chain end per molecule is 2.0, the amount of the silicon groups is  $1.75/2.0 = 87.5\%$  per molecule. For claim 2, Homma teaches that the terminal groups of the polypropylene oxide are allyl ether groups or  $(\text{CH}_2=\text{CHCH}_2\text{O}-)$  groups. This falls within applicant's general formula (1) wherein  $\text{R}^1=\text{H}$  and  $\text{R}^2=-\text{CH}_2-$ . Homma teaches that the silane used is methyldimethoxysilane, which falls within applicant's general formula (3) wherein  $m=0$ ,  $a=2$ ,  $\text{X}=\text{methoxy}$ , and  $\text{R}^4=\text{methyl}$ . Here, Homma also teaches the use of a platinum or Group VIII transition metal catalyst. In column 4, lines 32-60, Homma teaches the addition of an epoxy resin to the composition.

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For claim 4, in column 5, lines 60-65, Homma teaches the addition of a compound that has groups reactive with epoxy and silicon groups.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isayama et al. (U.S. Patent No. 4,657,986) as applied to claims 1 and 2 above, and further in view of Watabe et al. (U.S. Patent No. 5,811,566).

For claims 1 and 2, Isayama teaches the limitations of these claims as detailed above. Isayama fails to teach that the chain terminus of the polyoxyalkylene polymer is derived from 3-chloro-2-methylpropene or methallyl chloride.

Watabe teaches in column 1, lines 49-53, that it is a well known method that a hydroxyl group containing polyether is reacted with alkenyl chlorides such as allyl chloride or methallyl chloride to introduce a terminal alkenyl group.

Isayama and Watabe are analogous art in that they both relate to the synthesis and use of polyethers capped with unsaturated groups and subsequent modification by a silicon group.

It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the allyl chloride used in the preparation of the alkenyl terminated

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polypropylene oxide of Isayama with methallyl chloride. This would result in the chain terminus set forth by applicant in the formula in claim 3 after reaction with methyldimethoxysilane. It is prima facie obvious to substitute equivalents, motivated by a reasonable expectation that the respective species will behave in a comparable manner or give comparable results in comparable circumstances. *In re Ruff* 118 USPQ 343, *In re Jeze* 158 USPQ 99; the express suggestion to substitute one equivalent for another need not be present to render the substitution obvious. *In re Font*, 213 USPQ 532.

12. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al. (U.S. Patent No. 4,952,643) as applied to claims 1 and 2 above, and further in view of Watabe et al. (U.S. Patent No. 5,811,566).

For claims 1 and 2, Hirose teaches the limitations of these claims as detailed above. Hirose fails to teach that the chain terminus of the polyoxyalkylene polymer is derived from 3-chloro-2-methylpropene or methallyl chloride.

Watabe teaches in column 1, lines 49-53, that it is a well known method that a hydroxyl group containing polyether is reacted with alkenyl chlorides such as allyl chloride or methallyl chloride to introduce a terminal alkenyl group.

Hirose and Watabe are analogous art in that they both relate to the synthesis and use of polyethers capped with unsaturated groups and subsequent modification by a silicon group.

It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the allyl chloride used in the preparation of the alkenyl terminated

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polypropylene oxide of Hirose with methallyl chloride. This would result in the chain terminus set forth by applicant in the formula in claim 3 after reaction with methyldimethoxysilane. It is prima facie obvious to substitute equivalents, motivated by a reasonable expectation that the respective species will behave in a comparable manner or give comparable results in comparable circumstances. *In re Ruff* 118 USPQ 343, *In re Jezei* 158 USPQ 99; the express suggestion to substitute one equivalent for another need not be present to render the substitution obvious. *In re Font*, 213 USPQ 532.

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Homma et al. (U.S. Patent No. 4,981,728) as applied to claims 1 and 2 above, and further in view of Watabe et al. (U.S. Patent No. 5,811,566).

For claims 1 and 2, Homma teaches the limitations of these claims as detailed above. Homma fails to teach that the chain terminus of the polyoxyalkylene polymer is derived from 3-chloro-2-methylpropene or methallyl chloride.

Watabe teaches in column 1, lines 49-53, that it is a well known method that a hydroxyl group containing polyether is reacted with alkenyl chlorides such as allyl chloride or methallyl chloride to introduce a terminal alkenyl group. These groups are treated as equivalents by Watabe.

Homma and Watabe are analogous art in that they both relate to the synthesis and use of polyethers capped with unsaturated groups and subsequent modification by a silicon group.

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It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the allyl chloride used in the preparation of the alkenyl terminated polypropylene oxide of Homma with methallyl chloride. This would result in the chain terminus set forth by applicant in the formula in claim 3 after reaction with methyldimethoxysilane. It is prima facie obvious to substitute equivalents, motivated by a reasonable expectation that the respective species will behave in a comparable manner or give comparable results in comparable circumstances. *In re Ruff* 118 USPQ 343, *In re Jezel* 158 USPQ 99; the express suggestion to substitute one equivalent for another need not be present to render the substitution obvious. *In re Font*, 213 USPQ 532.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fujita et al. (U.S. Patent No. 5,296,582) and Suzuki et al. (U.S. Patent No. 5,684,094) are cited for teaching related compositions. Takago et al. (U.S. Patent No. 4,323,488), Iwakiri et al. (U.S. Patent No. 5,342,914), and Ito et al. (U.S. Patent No. 6,248,915) are cited for teaching silicon-group modified polyoxyalkylene polymers.


15. EP 0 370 531 A and the Patent Abstract of JP 63 097675 A are listed as X references on the European Search Report. For EP 0 370 531 A, the examiner has applied a related U.S. Patent having common inventors, Homma et al. (U.S. Patent No. 4,981,728). For, JP 63 097675 A, the abstract does not teach the required amount of incorporation of terminal silicon groups.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey B. Robertson whose telephone number is (703) 306-5929. The examiner can normally be reached on Mon-Fri 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert A. Dawson can be reached on (703) 308-2340. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
Jeffrey B. Robertson  
Examiner  
Art Unit 1712

JBR  
January 15, 2003